Middle Niobrara NRD

2024 Annual Voluntary Integrated Management Plan (VIMP) Report

Reporting on 2024 Data and Activities

Middle Niobrara Natural Resources District – Valentine, NE

April 14th, 2025

Snake River – Downstream of Merritt Dam – South of Valentine, NE

Purpose

The Middle Niobrara Natural Resources District (MNNRD or District) and the Nebraska Department of Natural Resources (NeDNR or Department) jointly adopted a Voluntary Integrated Management Plan (VIMP) which became effective on December 30th, 2020.

Annual reports for the Voluntary IMP are intended to provide transparency between the MNNRD and NeDNR, and to keep the public informed about integrated water management activities within the District. This annual report covers the actions and progress made by the MNNRD in 2024 to implement voluntary IMP items with a focus on groundwater quantity.

MNNRD Reporting Responsibilities

The VIMP requires that the MNNRD annually reports on the following ground water data collected by the District:

1. Static groundwater level measurements.

2. Certification of groundwater uses and any changes to these certifications.

3. Information gathered through the municipal and non-municipal industrial accounting process.

4. Irrigation water use data collected by the District, such as from metered high capacity well flow data.

5. Stream gage measurements on District-sponsored gages.

6. Water well construction permits issued and denied and any conditions associated with the permits issued.

7. Any variances issued, including the purpose, location, any required offset, the length of time for which the variance is applicable, and the reasoning behind approval of the variance.

8. Approved transfers, including all the information provided with the application and used in the approval of the transfer, the location of the land area or well that is being transferred, and the location of the land area or well that will replace the original relevant flow meter data collected.

9. Any retirements of irrigated aces or other activities by the District for the purpose of mitigating depletions.

10. Information related to any water banking transactions.

11. In keeping with Neb. Rev. Stat. §46-715(3) which requires the IMP to include procedures to track depletions and gains to streamflow's resulting from new, retired, or other changes to uses:

    a. Geographic location of new water wells permitted.

    b. Depletion calculated (and method of calculation) for each new water well permitted.

c. Estimated total consumptive use of each new water well permitted.

d. Retirements of agricultural, municipal, or industrial groundwater consumptive uses.

e. Information on any mitigation or new projects that have occurred, including geographic location, description of type and operations of the project, source water of the project, and calculated benefits associated with the project (if the project is groundwater augmentation, the report should include calculated accretions as well as the method/models used to estimated accretion values)

f. Streamflow accretion activities.

g. Water banking activities.

h. District regulations/management activities (designated groundwater management areas, use restrictions, etc.)

i. New depletions accounting report.

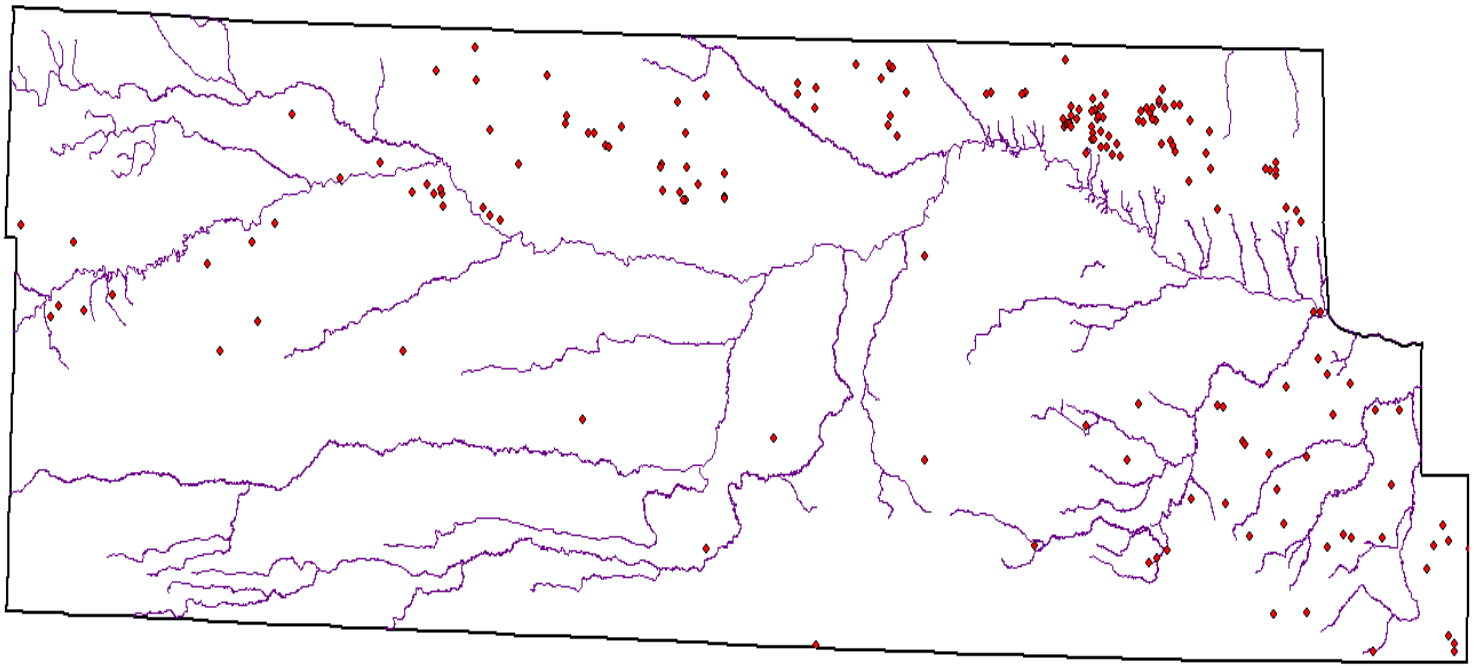
j. New data collected or model/study results (conservation measures, riparian ET, etc.).

k. Offsets provided for depletions resulting from increased consumptive use related to the above-listed items. This includes reporting on offsets and mitigation activities for the purpose of addressing new depletive water uses. Such activities to be reported include canal diversions for the purpose of groundwater recharge, operation of stream augmentation projects, conjunctive management, and irrigated acre retirements.

1. Static Groundwater Level Measurements

The Middle Niobrara NRD collects static groundwater level measurements at 225 sites across the district semi-annually. Measurements are collected prior to irrigation season in late March and early April, and again after the irrigation season in late October and early November. These time frames allow the District to see the full effects of the drawdown from the irrigation season and the subsequent recharge. These 225 sites consist of 74 dedicated monitoring wells and 151 irrigation wells. Total sampling sites have increased dramatically since 2011 when the Board of Directors required new irrigated acres to be sampled for groundwater quality and quantity. With the District being open for irrigated acre development again for the first time since 2014, there have been several new sites added to the list. The District also added 14 dedicated monitoring wells in 7 different locations in 2021/2022. Monitoring wells have dedicated data loggers/pressure transducers taking a water level measurement, once a day, every day of the year. With the help of NeDNR, the District added 15 real-time telemetry units to monitoring wells across our 4 counties. This real time, hourly data is a valuable addition to regular static water level data and a great educational tool.

MNNRD Water Quantity Sampling Sites



Groundwater levels in the majority of the MNNRD are relatively shallow and thus are relatively quickly impacted by weather patterns, precipitation, and increased/decreased groundwater use. The past year to 18 months has been a good testament to this. One of the highest precipitation years (2023) in recent history turned into a very cool and wet spring/early summer that then, in the blink of the eye, turned into a late summer/fall/winter of extreme drought. Early in the year, static water levels were trending back up over baselines and towards the highs of the past 5-6 years. Local farmers reported they irrigated as heavily in July, August, and September as they ever have, applying more in those 2-3 months than they do during entire growing seasons on an average year. These factors were displayed in our yearly Spring and Fall Static water levels. Spring levels were on a big rise following 2023 and the wet spring of 2024, and Fall levels produced an above average decline from measurements 6 & 12 months prior. While yearly static water levels can give clues to the condition of the underlying aquifer, it must be looked at in a holistic picture. In 2024 the MNNRD and DNR completed a Saturated Thickness Remaining Map, utilizing groundwater model info, historical static water levels, and saturated thicknesses to determine how much aquifer remains in the District. Percentages ranged from 96% remaining at the low end to 125% saturated thickness remaining at the high end. Saturated Thicknesses remaining must be taken into consideration with the actual Saturated Thickness at that location. The MNNRD has Saturated Thicknesses ranging from 50-800', as we sit on some of the thickest and most productive portions of the Ogalala Aquifer.

The District currently maintains an average of almost 0.5' above 1998 levels and 2.5' in the last 10 years.

The graph located below shows the changes in measurements from the fall of 2024, relative to the measurements from the fall of 2023(1), 2021(3), 2019(5), and 2014(10). Included in the graph are the highest and lowest changes measured since the fall of 2023 as well as the average change and the percentage of sampled wells showing an increase. Tables are sorted by each county and the District as a whole.

Fall 2024 Static Water Level Eval

Rock County	1 Year	3 Years	5 Years	10 Years	Oldest Measurement
# Wells Sampled	12	10	10	7	12
# Wells Increased	8	0	0	6	7
% Increased Since	67%	0%	0%	86%	58%
Average Change(Feet)	1.12	-4.03	-2.78	3.18	0.98

Brown County	1 Year	3 Years	5 Years	10 Years	Oldest Measurement
# Wells Sampled	40	43	44	37	44
# Wells Increased	9	1	9	33	18
% Increased Since	23%	2%	20%	89%	41%
Average Change(Feet)	-0.5	-2.43	-3.29	2.23	-0.30

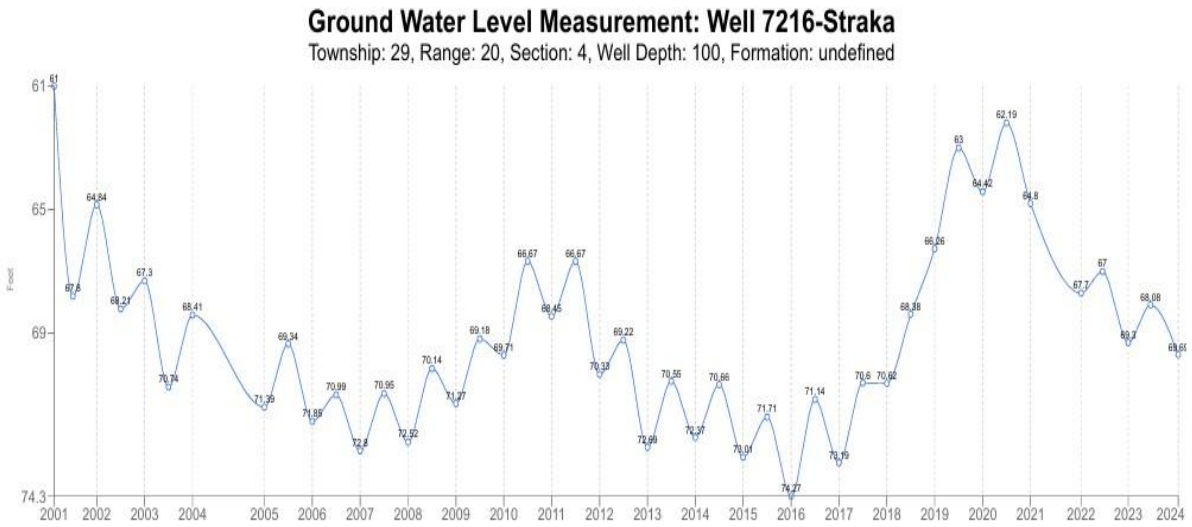
Cherry County	1 Year	3 Years	5 Years	10 Years	Oldest Measurement
# Wells Sampled	103	88	86	59	108
# Wells Increased	13	27	29	38	53
% Increased Since	13%	31%	34%	64%	49%
Average Change(Feet)	-1.44	-0.9	-1.27	1.5	0.36

Keya Paha County	1 Year	3 Years	5 Years	10 Years	Oldest Measurement
# Wells Sampled	37	34	34	29	37
# Wells Increased	6	13	3	25	17
% Increased Since	16%	38%	9%	86%	46%
Average Change(Feet)	-0.94	-0.53	-3.24	2.76	-0.05

MNNRD District	1 Year	3 Years	5 Years	10 Years	Oldest Measurement
# Wells Sampled	192	175	174	132	201
# Wells Increased	36	41	41	102	95
% Increased Since	19%	23%	24%	77%	47%
Average Change(Feet)	-0.44	-1.97	-2.65	2.42	0.25

One Representative Static Groundwater Level Graph from each county in the MNNRD

*Data From One Location that is a Representative Graph of **Western Rock County** Static Water Levels*



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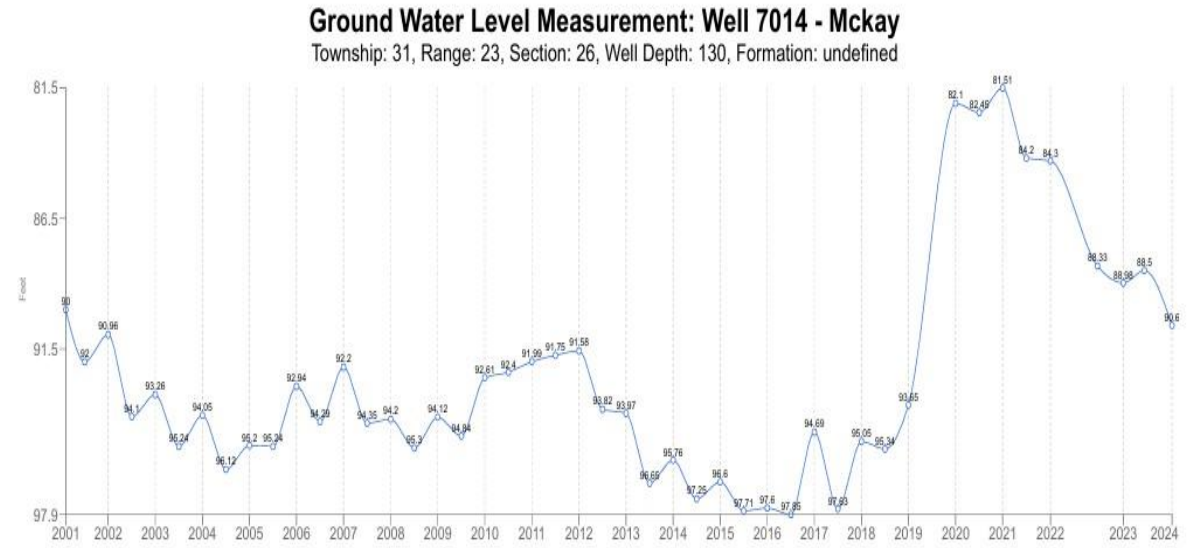
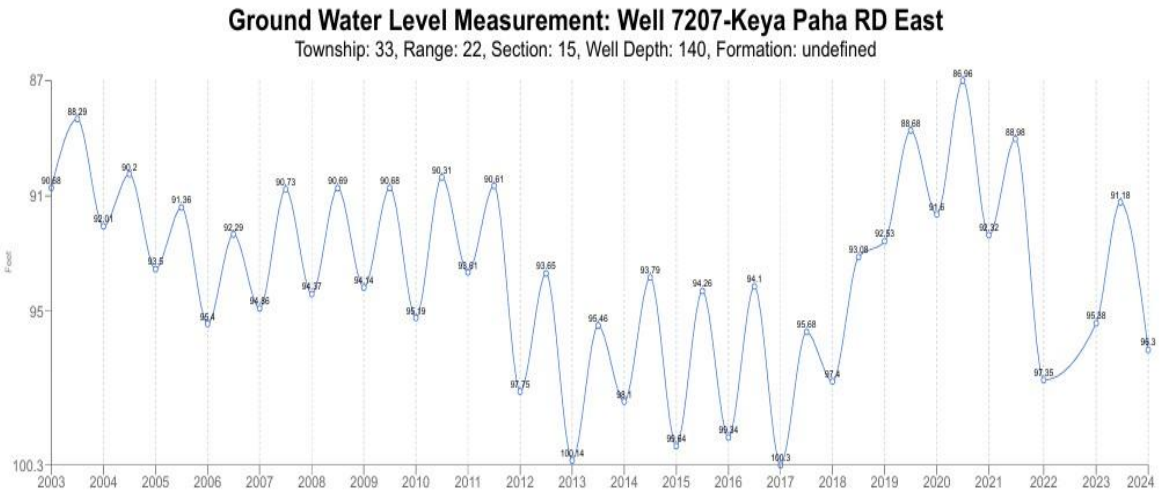
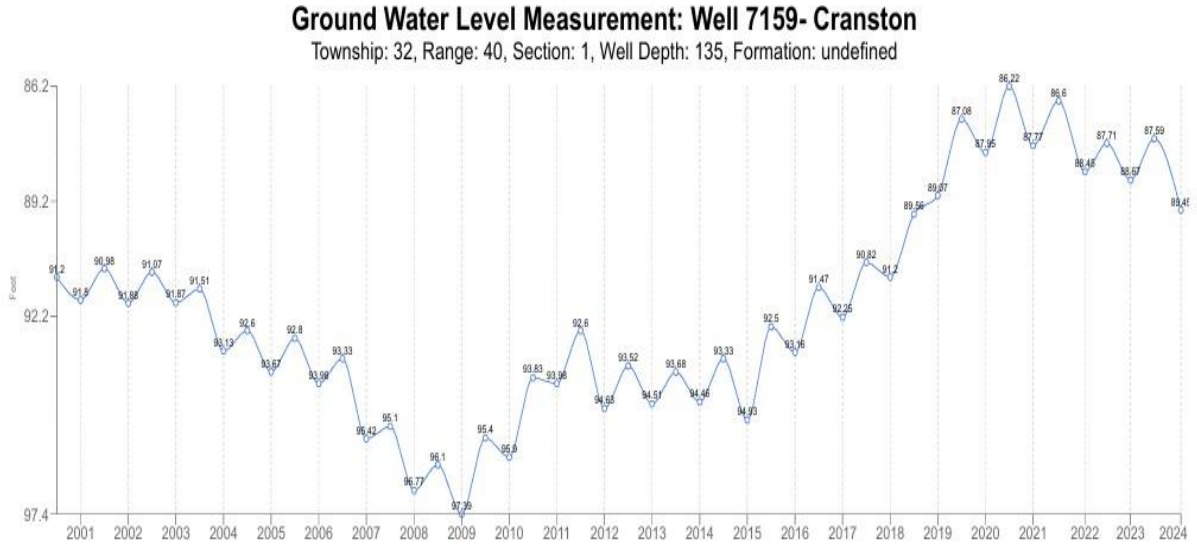
*Data From One Location that is a Representative Graph of **Brown County** Static Water Levels*



*Data From One Location that is a Representative Graph **of Keya Paha County** Static Water Levels*



*Data From One location that is a Representative Graph of **Cherry County** Static Water Levels*



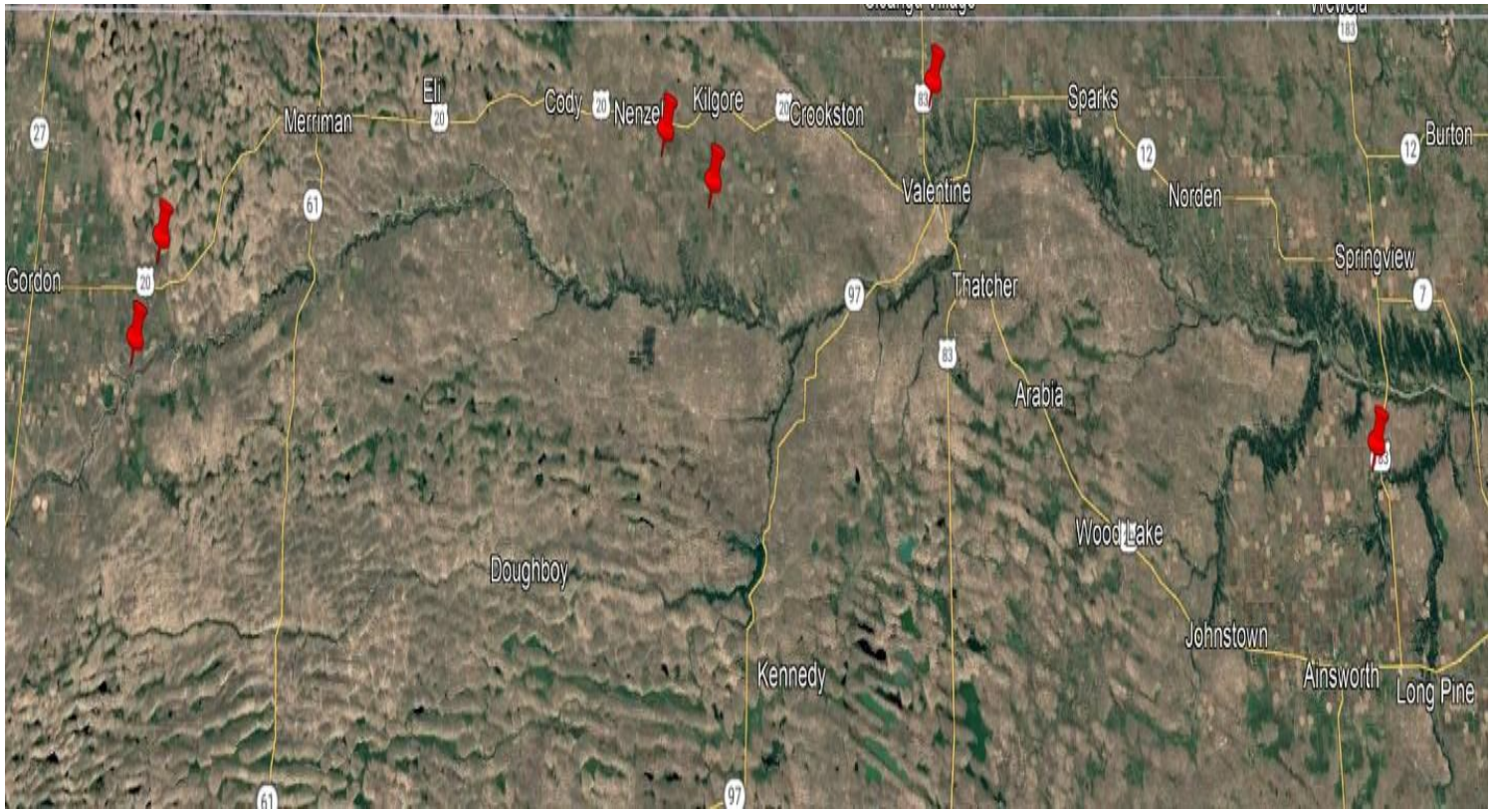
2. Certification of new groundwater uses and any changes to these certifications.

In 2024, the MNNRD Board of Directors accepted applications for up to 3,000 acres of new groundwater use. There were 6 applications submitted for 660 irrigated acres and 1 for a new high-capacity use that was withdrawn before Board review. All 6 applications met the minimum ranking score and were approved for development. Acres will be certified as they meet MNNRD completion requirements. If they do not meet completion or timeline requirements their approval will be revoked, and the acres not certified. The location and acres of the areas approved to develop are as follows:

Location	Acres Approved for New Development
NW/NE ¼ Sec. 9-31N-21W	115
NE/SW/SE ¼ Sec. 24-33N-40W	150
NE ¼ Sec. 1-34N-28W	13
SE ¼ Sec. 4-33N-31W	130
NE/NW ¼ Sec. 15/22-32N-40W	120
NW ¼ Sec. 26-34N-32W	132
Total	**660**

The MNNRD continues to update landowner and groundwater certification changes as they are available. The District shares its Certified Acre Map on a yearly basis with DNR so they can update their own current irrigated acre map.

Map of Locations Approved for New Irrigated Acres



3. Information gathered through the municipal and non-municipal industrial accounting process.

The Middle Niobrara NRD collects water use data from the local municipalities on a yearly basis. The municipalities below have reported data to the MNNRD. The 5-year average yearly use in millions of gallons for each city or village is found below.

City / Village	Average Municipal Pumping (Millions of Gallons)
City of Valentine	300.90
City of Ainsworth	153.50
Village of Woodlake	12.87
Village of Crookston	4.97
Village of Kilgore	4.75
Village of Merriman	18.40
Village of Cody	5.9
City of Long Pine	27.21

4. Irrigation water use data collected by the District.

Middle Niobrara NRD staff read and collect data on about 90 flow meters in the district. The board of directors voted to require flow meters on all new irrigation wells drilled after 2011, but do not require an irrigation allotment or consumptive use cap. Staff collect data on these mandatory meters, as well as a handful of flow meters that landowners have voluntarily installed and given permission for the MNNRD to utilize. Landowners in Management Zone 3 are required to report estimated water use in their yearly report forms. There are about 1,100 water use reports and flow meter measurements recorded through this process. Per crop type averages in **Acre Inches** for 2024 are as follows:

Crop Type	Average Water Use In Acre Inches
Corn	**17.25”** (13.8” in 2023)
Soybeans	**15.75”** (11.4” in 2023)
Alfalfa	**10.9”** (9” in 2023)
Forage Crop	**9.1”** (8.7” in 2023)

5. Stream gage measurements on District-sponsored gages.

The Middle Niobrara NRD does not currently sponsor any stream gage measuring equipment.

The Niobrara River Basin Alliance (NRBA) will be involved in the deployment of a stream gauge on the Niobrara in cooperation with the orders provided by the Department of Natural Resources during the purchase of the Water Rights associated with NPPDs Hydro-facility. Data from that gauge will be provided after installation.

The MNNRD does contract sampling and flow measurements for NDEE on Long Pine and Plum Creek monthly. On a 5-year rotation, district wide stream measurements and sampling are completed every week during the summer. The next basin rotation will be during the summer of 2026. This data is available through NDEE.

6. Water well construction permits issued or denied and any conditions associated with the permits issued.

In 2024, the Middle Niobrara approved 19 high capacity (>50 GPM) well construction permits, down from 34 permits in 2023. Out of the 19 permits issued, 3 of the permits were permits for replacement irrigation wells and 16 were permits for new wells serving new irrigated acres. Permits for new irrigation wells were approved through the new irrigated acre process, acre transfers, or variance requests.

There are 14 conditions and restrictions in place during the process of an *Application For A Permit To Construct A Water Well In The MNNRD*. Staff review all well permit applications to ensure accuracy and feasibility. Permits are then passed onto DNR for their review. If an application has or may cause issues, the Board of Directors may apply any other conditions to the permit application. Past examples include limits on total GPM pumped, location of the replacement well, water use efficiency improvements, required flow meters, or an offset for the new well.

7. Variances

Examples of variances commonly applied for in the MNNRD are:

- Trading surface water rights for groundwater rights and the ability to drill a groundwater well during a moratorium.
- Variance to violate the groundwater well moratorium

There were no variances applied for by any landowners in the MNNRD in 2024.

8. Certified Irrigated Acre Transfers

Information on transfer applications includes landowner requesting and providing the transfers, legal description, total acres being transferred, nature of the transfer, and well registration numbers if applicable. After receiving the application, MNNRD staff add the following information from both locations to the application:

Stream Depletion (SDF)

Slope and Erosion Issues

Title Report (Free and Clear Titles)

Static Water levels

Groundwater Index

Reason for the Transfer

After reviewing the application, the Board of Directors will consider all factors and decide whether to approve, approve with conditions, or deny the application.

The MNNRD Board of Directors approved one irrigated acre transfer in 2024. See Table below.

Original Location	Transferred Location	Acres	Nature of Transfer
NW ¼ Sec. 35-32-22	SW ¼ Sec. 32 – 32 – 21	1.5	New Irrigation Development

9. Retirements of irrigated acres or other activities by the District for the purpose of mitigating depletions.

The Middle Niobrara continues to be heavily involved in the Niobrara River Basin Alliance's administration of the surface waters rights acquired from NPPD for the purpose of Instream Basin Management. 2024 was the first year of administration on the river since 2018, with numerous days of closure for junior appropriators due to the hot and dry weather conditions. NRBA entered into 49 new subordination agreements with interested junior appropriators.

The Ainsworth Irrigation District (AID), the MNNRD, and DNR continue to work together on potential projects that can reduce the amount of water going through the AID canal system that isn't being used for its intended purposes. Potential projects include reuse pits, holding facilities, and updated gate and flow monitoring technology. These projects can help keep water in the Snake River and bound for the Niobrara River, instead of being turned out and seeping away along the canal. Canal water turnouts directly damage streams, stream banks, and stream beds and have created an artificial water mound in portions of Brown and Eastern Cherry counties.

The District has cost share money available to landowners wishing to improve their irrigation water use efficiency. Projects like adding flow meters, soil moisture probes, gravity to center pivot irrigation conversions, and high pressure to low pressure conversions are eligible for cost share.

District staff and the Board of Directors continue to encourage landowners to apply to relinquish surface water rights and uses in exchange for groundwater uses. These exchanges have immediate impacts to stream depletions and can be beneficial to all parties involved.

New irrigated acres and irrigated acre transfer applications presented to the District that have lower stream depletions are given preference during scoring and ranking procedures. The MNNRD does not allow new irrigated acre applications in areas with > 90% stream depletion.

10. Water Banking

The Middle Niobrara has a database of irrigated acres the District has banked from reducing stream depletions since 2008. The MNNRD started accepting Certified Irrigated Acre transfer applications in 2008 when the District finished its irrigated acre certification process. Transferring irrigated acres from a low to a higher stream depletion (SDF) requires an acre offset. Acres transferred from a higher SDF to a lower SDF are only allowed at a 1:1 ratio, with the MNNRD banking the remaining difference. Landowners are also encouraged by the MNNRD to transition their surface water irrigation to groundwater irrigation as these scenarios always result in a reduction in SDF. As a result of the 65 transfers since 2008, the MNNRD has banked a total of **1,899.10** groundwater-irrigated acres.

Conclusion

The Middle Niobrara NRD looks forward to continuing the partnership with the Nebraska Department of Natural Resources in maintaining and enhancing all our water resources throughout the District. This yearly report is a great opportunity to evaluate the surface and groundwater controls in place, as well as preserving an open line of communication between both parties. Staff and the Board of Directors are committed to a progressive approach to ensuring ample water quantity for all users.

Middle Niobrara NRD